DOCUMENT RESUME

ED 108 000 CE 004 425

AUTHOR Kilo, Joseph L.
TITLE An Analysis of the Diesel Truck Mechanic Occupation.
INSTITUTION Ohio State Dept. of Education, Columbus. Div. of Vocational Education.; Ohio State Univ., Columbus. Trade and Industrial Education Instructional Materials Lab.
SPONS AGENCY Office of Education (DHEW), Washington, D.C.
PUB DATE [75]
NOTE 189p.; For related documents, see CE 004 160-206, CE 004 263-268, and CE 004 426-427

EDRS PRICE MF-$0.76 HC-$9.51 PLUS POSTAGE
DESCRIPTORS *Auto Mechanics (Occupation); Communication Skills; *Diesel Engines; *Job Analysis; Knowledge Level; Mechanics (Process); *Occupational Information; Safety; Skill Analysis; Skill Development; Skilled Occupations; *Task Analysis; Task Performance; Work Attitudes
IDENTIFIERS *Diesel Truck Mechanics

ABSTRACT

The general purpose of the occupational analysis is to provide workable, basic information dealing with the many and varied duties performed in the diesel truck mechanic occupation. The document opens with a brief introduction followed by a job description. The bulk of the document is presented in table form. Thirteen duties are broken down into a number of tasks and for each task a two-page table is presented, showing on the first page: tools, equipment, materials, objects acted upon; performance knowledge (related also to decisions, cues and errors); safety--hazard; and on the second page: science; math--number systems; and communications (performance modes, examples, and skills and concepts). The duties include maintaining and repairing engines, fuel systems, electrical systems, cooling systems, brake systems, driveline, steering systems, suspension, exhaust systems, hydraulic systems, refrigeration and air conditioning systems, chassis components, and cab and accessories. (BP)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

CE004 425

Occupational Analysis

ED108000

DIESEL TRUCK MECHANIC

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

JUN 1 1 197

Instructional Materials Laboratory
Trade and Industrial Education
The Ohio State University

5267

AN ANALYSIS OF THE DIESEL TRUCK MECHANIC OCCUPATION

Developed By

Joseph L. Kilo
Instructor, Diesel Mechanics
Cuyahoga Valley J.V.S.
Brecksville, Ohio

Occupational Analysis
E.P.D.A. Sub Project 73402
June 1, 1973 to December 30, 1974
Director: Tom L. Hindes
Coordinator: William L. Ashley

The Instructional Materials Laboratory
Trade and Industrial Education
The Ohio State University

"The activity which is the subject of this report was supported in whole or in part by the U.S. Office of Education, Department of Health, Education and Welfare. However, the opinions expressed herein do not reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred."

TABLE OF CONTENTS

Foreward v

Preface vii

Acknowledgment ix

Job Description xi

Duties

A Maintaining and Repairing Engines 1
B Maintaining and Repairing Fuel Systems 15
C Maintaining and Repairing Electrical Systems 29
D Maintaining and Repairing Cooling System 45
E Maintaining and Repairing Brake System 65
F Maintaining and Repairing Driveline 85
G Maintaining and Repairing Steering Systems 107
H Maintaining and Repairing Suspension 117
I Maintaining and Repairing Exhaust Systems 133
J Maintaining and Repairing Hydraulic Systems 143
K Maintaining and Repairing Refrigeration and Air Conditioning Systems . 153
L Maintaining and Repairing Chassis Components 167
M Maintaining and Repairing Cab and Accessories 175

FOREWARD

The occupational analysis project was conducted by The Instructional Materials Laboratory, Trade and Industrial Education, The Ohio State University in conjunction with the State Department of Education, Division of Vocational Education pursuant to a grant from the U.S. Office of Education.

The Occupational Analysis project was proposed and conducted to train vocational educators in the techniques of making a comprehensive occupational analysis. Instructors were selected from Agriculture, Business, Distributive, Home Economics and Trade and Industrial Education to gain experience in developing analysis documents for sixty-one different occupations. Representatives from Business, Industry, Medicine, and Education were involved with the vocational instructors in conducting the analysis process.

The project was conducted in three phases. Phase one involved the planning and development of the project strategies. The analysis process was based on sound principles of learning and behavior. Phase two was the identification, selection and orientation of all participants. The training and workshop sessions constituted the third phase. Two-week workshops were held during which teams of vocational instructors conducted an analysis of the occupations in which they had employment experience. The instructors were assisted by both occupational consultants and subject matter specialists.

The project resulted in producing one hundred two trained vocational instructors capable of conducting and assisting in a comprehensive analysis of various occupations. Occupational analysis data were generated for sixty-one occupations. The analysis included a statement of the various tasks performed in each occupation. For each task the following items were identified; tools and equipment; procedural knowledge; safety knowledge; concepts and skills of mathematics, science and communication needed for successful performance in the occupation. The analysis data provided a basis for generating instructional materials, course outlines, student performance objectives, criterion measures, as well as identifying specific supporting skills and knowledge in the academic subject areas.

PREFACE

This analyses of the Diesel Truck Mechanic occupation is a basic overview of the job. It includes those tasks basic to a mechanic. No supervisory tasks are included. The analysis in organized by realted task systems.

ACKNOWLEDGMENT

We wish to acknowledge the valuable assistance rendered by the following subject matter specialists. They provided input to the vocational instructors in identifying related skills and concepts of each respective subject matter area and served as training assistants in the analysis process during the two-week workshops.

Rollin M. Barber, Psychology
The Ohio State University
Columbus, Ohio

Jodi Beittel, Communications
Columbus, Ohio

Diana L. Buckeye, Mathematics
University of Michigan
Avon Lake, Ohio

Rick Fien, Chemistry
The Ohio State University
Beachwood, Ohio

N.S. Gidwani, Chemistry
Columbus Technical Institute
Columbus, Ohio

Bruce A. Hull, Biology
The Ohio State University
Columbus, Ohio

Donald L. Hyatt, Physics
Worthington High School
Worthington, Ohio

Glenn Mann, Communications
Columbus, Ohio

Jerry McDonald, Physical Sciences
Columbus Technical Institute
Reynoldsburg, Ohio

Colleen Osinski, Psychology
Columbus Technical Institute
Columbus, Ohio

David Porteous, Communications
University of Connectiuct
Colchester, Connecticut

James A. Sherlock, Communications
Columbus Technical Institute
Columbus, Ohio

Jim VanArsdall, Mathematics
Worthington High School
Worthington, Ohio

Lillian Yontz, Biology
The Ohio State University
Caldwell, Ohio

Acknowledgment is extended to the following I. M. L. staff members for their role in conducting the workshops; editing, revising, proofing and typing the analyses.

Faith Justice	Research Associate
Sheila Nelson	Administrative Assistant
Marsha Opritza	Editorial Consultant
Peg Bushelman	Typist
Carol Fausnaugh	Typist
Mindy Fausnaugh	Typist
Rita Hastings	Typist
Carol Hicks	Typist
Sue Holsinger	Typist
Barbara Hughes	Typist
Rita Kehagias	Typist
Carol Marvin	Typist
Patti Nye	Typist
Kathy Roediger	Typist
Mary Salay	Typist

Job Description

The Truck Diesel Mechanic will perform the duties as a journeyman mechanic:

Maintaining, repairing, dismantling and rebuilding of electric and internal combustion motor vehicles, chassis, trailers and parts thereof, including starting, lighting, ignition, carburator, fuel injection and battery; repairing and adjusting, relining and servicing of brakes; installing radio and vehicle heating and cooling systems: wheel aligning, installing and repairing speedometers, windshield wipers and all other accessories; replacing and repairing of radiators, hoods, pans and fenders, lamps and all machine work and welding in connection with maintenance and repair work; maintaining and repairing bodies and doors, fenders, running boards, seats, body frames, wheels, tires of automobiles and trucks; and towing in disabled vehicles, and other road service work.

10

A Maintaining and Repairing Engines

1 Rebuild Short Block
2 Recondition Cylinder Head
3 Inspect and Service Lube Oil System
4 Assemble Engine
5 Remove and Replace Engine
6 Inspect and Service Blower

11

(TASK STATEMENT) Rebuild Short Block

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Torque wrench Hone Micrometer Dial boregauge Pullers Cam bearing driver Bearings Gaskets Rings Pistons Seals Liners Timing gears Oil Grease Followers Cam shaft Crankshaft Solvent	Disassemble and clean block Mic all bearing surfaces Inspect liners Remove and replace liners Remove and replace cambearings Install camshaft Install crankshaft with new bearings & seals Inspect pistons and rods Install pistons with new rings & bearings Check clearances Install cam followers Lube parts & assembled Install covers Install vibration damper Install accessory drives	Wear eye protection

DECISIONS	CUES	ERRORS
Determine what engine parts can be re-used Determine what caused problem	Noisy operation Excessive oil use Broken parts	Short engine life

(TASK STATEMENT) Rebuild Short Block

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage (Examples: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines. Fluids under pressure. (Examples: Incompressibility, transfer of pressure) Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculations: Ratio Fundamental Operations (Calculations) Basic Measurement Skills and Concepts Instruments: micrometer Geometric Measurement: degrees of angle, volume, length Non-geometric measurement: Oil, R.P.M. Reading and interpreting tables, charts and graphs: specification chart Basic Algebra Skills and Concepts: Uses of variables in formulas Basic Deductive Logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Recondition Cylinder Head

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON		PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit	Solvent	Disassemble head	Wear eye protection
Valve spring compressor	Seals	Clean and inspect head	Use care with grinding stones
Valve reface		Reface valves	
Valve seat grinder		Knurl valve guides or replace	
Knurling tool		Reset cylinder head	
Spring tension tester		Check valve seat position	
Micrometer		Test spring tension	
Dial indicator		Install spring with retainers, keepers and new seals	
Small hole gauge			
Straight edge			
Torque wrench			
Valves			
Springs			
Prussian blue			
Retainers			
Keepers			
Oil			
Grease			
Guides			

DECISIONS	CUES	ERRORS
Determine if valves can be reused	Poor compression Excessive oil use	Short valve life

(TASK STATEMENT) Recondition Cylinder Head

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. (Examples: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Fluids under pressure. (Examples: Incompressibility, transfer of pressure) Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculations: Ratio Fundamental Operations: (Calculation) Basic Arithmetic Skills and Concepts Estimation: Round off decimals Basic Measurement Skills and Concepts Instruments: Micrometer Geometric Measurement: Length, angles Non-geometric Measurement: Torque, oil Reading and interpreting tables, charts and graphs: specification chart Basic Algebra Skills and Concepts: uses of variables in formulas Basic Deductive Logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT)Inspect and Service Lube Oil Systems

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Depth Torque wrench Gears Shafts Bushings Lines Float Fittings Filters Pressure relief valve Oil cooler Lube Sealer Solvent	Disassemble and check oil pump Rebuild oil pump Inspect float Test pressure relief valve Test oil cooler for leaks Change filters Inspect lines	Wear eye protection

DECISIONS	CUES	ERRORS
Determine if oil pump needs replaced Determine if oil pressure is correct	Low oil pressure Always rework system when rebuilding engine	Damage to engine

(TASK STATEMENT) Inspect and Service Lube Oil Systems

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. (examples: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials. (Change of dimensions) Effect of heating and cooling on state of matter (Change of matter from one form to another) Fluids under pressure (examples: Incompressibility, transfer of pressure) Transfer of heat from one body to another Behavioral Science See appendix	Set of real numbers : Rationals Fundamental Operations (Calculation) Basic arithmetic skills and concepts: Ratio Basic measurement skills and concepts Instruments: depth gauge Geometric measurement: Length Non-geometric measurement: torque, liquid, temperature Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Assemble Engine

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Torque wrench Dial indicator Sealer Gaskets Seals Solvent	Install oil pan Install head Install valve train Install injectors Adjust valves Adjust injectors Install fuel lines Install valve covers Install bell housing Install accessories Install manifolds	Wear eye protection
[illegible]	[illegible]	[illegible]

(TASK STATEMENT) Assemble Engine

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. (Examples: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Fluids under pressure (Examples: Incompressibility, transfer of pressure)	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: micrometer Metric and English measure and conversion Geometric measurement: Length Non-geometric measurement: Torque, oils Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Remove and Replace Engine

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Hoist Drain pan Engine mounts Clamps Hoses Solvent	Drain oil Drain coolant Remove and replace hood Remove and replace radiator Disconnect lines Disconnect linkages Remove mounts Remove engine Install new engine Hook up all accessories Fill crank case Fill with coolant Use factory recommended start up procedures	Wear eye protection Use proper lifting procedures and points
DECISIONS Determine specifications of particular manufacturer	**CUES** Engine need replaced	**ERRORS** Engine failure

(TASK STATEMENT) Remove and Replace Engine

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage (Examples: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Fluids under pressure (Examples: Incompressibility, transfer of pressure) Behavioral Science See appendix	Set of real numbers: Rationals Fundamental operations (Calculations) Basic arithmetic skills and concepts Ratio and proportion: coolant solution Basic measurement skills and concepts Non-geometric measurement: oil, coolant Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination.
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Blower

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Torque wrench Micrometer Hone Seals Bearings Gaskets Rotors Gears Pump drive Solvent	Disassemble and clean blower Inspect rotors Inspect housing Inspect bearings Inspect gears Assemble all parts Check and adjust clearances	Wear eye protection

DECISIONS	CUES	ERRORS
Determine which parts are reuseable Determine what specifications are required	Low blower pressure	Poor engine performance Blower failure

(TASK STATEMENT) Inspect and Service Blower

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. (Examples: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials (Change of dimensions) Fluids under pressure (Examples: Incompressibility, transfer of pressure) Centrifugal forces developed by bodies in rotation (Example: Force tending to discharge material from a rotating body) Effects of friction on work processes and product quality Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental operations (Calculation) Basic arithmetic skills and concepts Estimation: round off decimals, guess and check method. Basic measurement skills and concepts: Geometric measurement: length, volume Non-geometric measurement: torque, R.P.M. Reading and interpreting tables, charts and graphs: specification charts Instruments: micrometer Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

B Maintaining and Repairing Fuel Systems

1 Inspect and Service Fuel Tank and Lines
2 Test and Service Fuel Pump (Gas)
3 Test and Service Fuel Pump (Diesel)
4 Inspect and Service Carburetor
5 Inspect and Service Fuel Injectors
6 Inspect and Service Governors

24

(TASK STATEMENT) Inspect and Service Fuel Tank and Lines

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Flaring tool Cutting tool Torch Tank Fuel lines Fuel hoses Brackets Straps Fittings Solvent Solder Sending unit	Inspect tank Inspect lines Remove and replace tank Remove and replace lines Repair tank Clean tank Remove and replace sending unit	Wear eye protection Use well ventiltated area Be careful with open flame when repairing tank Hazard Fumes explosive
DECISIONS	**CUES**	**ERRORS**
Determine if tank can be repaired	Fuel leaks Dirt Restrictions	Fuel system failure

(TASK STATEMENT) Inspect and Service Fuel Tank and Lines

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage (Examples: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials (Change of dimensions) Fluids under pressure (Examples: Incompressibility, transfer of pressure) Behavioral Science See Appendix	Set of real numbers: Rationals Uses of numbers without calculations: Ratio Fundamental operations (Calculation) Basic measurement skills and concepts Geometric measurement: volume Non-geometric measurement: Temperature, fuel, R.P.M. Reading and interpreting tables, charts and graphs: specification charts Basic algebra skills and concepts Uses of variables Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Test and Service Fuel Pump (Gas)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Pressure gauge Graduate Diaphagm Spring Valves Gaskets Sealer Solvent Fittings	Test fuel pump Remove and replace pump Rebuild fuel pump	Wear eye protection Use well ventilated area Hazard Fumes explosive

DECISIONS	CUES	ERRORS
Determine if pump pressure is low Determine if pump volume is low	Engine missing or cutting out Leaking fuel	Fuel system failure

(TASK STATEMENT) Test and Service Fuel Pump (Gas)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. (Example: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials (Change of matter from one form to another) Fluids under pressure (Examples: Incompressibility, transfer of pressure) Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculations) Basic Arithmetic Skills and Concepts Estimation by rule of thumb: pint/10 seconds Basic measurement Skills and Concepts: Instruments: pressure gauge Metric measure Geometric measurement: volume Non-geometric measurement: fuel, pressure Reading and interpreting tables, charts and graphs: specification chart Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic (ordering of thoughts and ideas), noise discrimination (recognize proper and improper sounds: animal, human, machine)
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Test and Service Fuel Pump (Diesel)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Pump test stand Pressure gauge Hand tack Micrometer Gaskets Seals Plungers Shaft Gears Shims Filter Springs Bearings Solvent	Inspect pump operation Remove and replace pump Disassemble and clean Inspect parts Assemble with new parts and gaskets Calibrate pump	Wear eye protection Hazard Fluids under high pressure
DECISIONS Determine specification for particular engine Determine which parts can be reused	**CUES** Poor performance Incorrect speed	**ERRORS** Faulty pump operation

(TASK STATEMENT) Test and Service Fuel Pump (Diesel)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage (Example Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Fluids under pressure (Examples: Incompressibility, trans - fer of pressure) Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculations) Basic measurement skills and concepts Instruments: micrometer Metric measurement Geometric measurement: volume Non-geometric measurement: fuel, pressure Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Carburetor

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Tachometer Vacuum gauge Repair kit Solvent Jets Accelerator pump Gaskets Filter	Diagnose carburetor problem Remove and replace carburetor Disassemble a clean carburetor Install new parts as required Adjust float Adjust carburetor after it is on vehicle	Safety Wear eye protection Use well ventilated area Hazard Gasoline fumes

DECISIONS	CUES	ERRORS
Determine what factory specifications are Determine what parts need replacing	Leaking fuel Poor performance	Poor performance Poor fuel mileage

(TASK STATEMENT) Inspect and Service Carburetor

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. (Examples: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Fluids under pressure (Examples: Incompressibility, transfer of pressure) Effect of heating and cooling on state of matter. (Change of matter from one form to another) Transfer of heat from one body to another Behavioral Science See appendix	Set of real numbers: rationals Uses of numbers without calculation: Ratio Fundamental operations (Calculation) Basic measurement skills and concepts Instruments: pressure gauge Geometric measurement: volume Non-geometric measurement: pressure, vacuum, fuel, R.P.M. Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]		[illegible]
[illegible]		[illegible]
[illegible]		[illegible]
[illegible]		[illegible]
[illegible]		[illegible]

(TASK STATEMENT) Inspect and Service Fuel Injectors and Nozzles

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Torque wrenchs Comparator Spray Pattern tester Tip cleaner Spring tension tester Orfices O-rings Gaskets Springs	Diagnose injector problems Remove and replace injector Disassemble and clean injector Inspect parts Assemble with new parts as required Flow test injector Adjust injector	Wear eye protection Hazard Fluids under high pressure
DECISIONS	**CUES**	**ERRORS**
Determine if injectors need adjusted or replaced Determine factory specifications on injectors Determine which parts can be reused	Smoke Missing	Poor performance

(TASK STATEMENT) Inspect and Service Fuel Injectors and Nozzles

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage (Examples: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials. (Change of dimensions) Effect of heating and cooling on state of matter. (Change of matter from one form to another) Fluids under pressure. (Examples: Incompressibility, transfer of pressure) Transfer of heat from one body to another Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Uses of numbers without calculation: Ratio Basic measurement skills and concepts Instruments: Comparator Geometric measurement: volume Non-geometric measurement: weight, fuel, R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses at variables in formulas Basic deductive lo

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Governors

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Tachometer Governor adjusting tool Gaskets Spring Seal	Warm engine up before checking R.P.M. Check R.P.M. Remove and replace governor Adjust governor	Wear eye protection Warm engine up before checking R.P.M.

DECISIONS	CUES	ERRORS
Determine recommended R.P.M. Determine if R.P.M. is correct	R.P.M. too high R.P.M. too low	Engine failure Poor performance

(TASK STATEMENT) Inspect and Service Governors

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage (Examples: Levers, gears, pulleys) Work input, work output, friction and efficiency in simple machines Behavioral Science See appendix	Set of real numbers: Rationals Fundamental operations (Calculation) Basic measurement skills and concepts Instruments: vacuum gauge Geometric measurement: volume Non-geometric measurement: vacuum, R.P.M. Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic.
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination.
Viewing		Visual analysis, logic, recognition of symbols, codes and emblems

C Maintaining and Repairing Electrical Systems

1 Inspect and Service Battery and Primary Wiring
2 Inspect and Service Starter and Switches
3 Inspect and Service Charging Circuit
4 Inspect and Service Ignition System
5 Inspect and Service Lighting Circuits
6 Inspect and Service Electric Shift Mechanism
7 Inspect and Service Electrical Accessories

(TASK STATEMENT) Inspect and Service Battery and Primary Wiring

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hydrometer Volt-amp tester Cable puller Terminal cleaner Terminal spreader Soda Distilled water Battery charger Basic tool kit Ohm meter	Take gravity readings Clean terminals Inspect cable resistance Clean battery Fill battery Test battery amps and volts Light load test Charge battery	Hydrogen gas that is omitted is explosive Be careful of acid burns Remove ground cable first and replace last Arc caused Wear eye protection

DECISIONS	CUES	ERRORS
Make sure battery will hold a charge Find proper battery specifications	Hard starting P.M. service Corrosion	Short battery wire Down time

(TASK STATEMENT) Inspect and Service Battery and Primary Wiring

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Transfer of energy from one form to another (Example: Chemical reaction generating voltage) Addition and subtraction of whole numbers (Example: Generative of hydrogen) Resistance of materials to flow of electrical current (Example: Cable resistance) Addition and subtraction of whole numbers (Example: Chemical neutralization; clean battery) Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts: Instruments: ohm meter, hydrometer Geometric measurement: volume Non-geometric measurement: ohms, surfuric acid, hydrometer Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Starter and Switches

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Test light Amp meter Lathe Growler Brushes, points Solvent Bushings Solder Solder iron Tape	Test solenoid Test series parallel switch Test starter draw Remove and replace starter Disassemble and clean starter Test armature and fields Turn down commutator Assemble with new brushes and bushings Remove and replace solenoid Recondition solenoid Remove and replace series parallel switch Recondition series parallel switch Check and replace starter drive	Hazard: Finger rings Use proper solvent Safety: Disconnect battery before working on system

DECISIONS	CUES	ERRORS
Determine if starter needs repair Determine if solenoid needs repair Determine if series parallel switch needs repair	Resistance too high Vehicle will not start	Engine will not start Cause problems in other areas

(TASK STATEMENT) Inspect and Service Starter and Switches

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Resistance of materials to flow of electrical current Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: volt amp meter Non-geometric measurement: R.P.M., electricity Reading and interpreting tables, charts, and graphs: specification charts

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic (ordering of thoughts and ideas) noise discrimination (recognize proper and improper sounds: animal, human machine)
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Charging Circuit

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Alternator-Generator-Regulator tester Test light Ohm meter Diode Tester Growler Lathe Puller Press Brushes Bearings Wires Terminals Solder Solder iron Tape	Test alternator Test generator Test regulator Test wiring Remove and replace generator Remove and replace alternator Remove and replace regulator Disassemble and clean alternator Test rotor, stator, and diodes Disassemble and clean generator Test armature Test field Turn Commutator Assemble alternator and generator with new bearings and brushes Adjust regulator Polarize D.C. regulator Adjust belt tension	Hazard Finger rings-conduct electricity Safety Disconnect battery before working on units a. Cause arcs b. Accidental starting

DECISIONS	CUES	ERRORS
Determine if alternator, generator or regulator is bad Determine if capacity will maintain battery charge	Unit not charging Battery dead Lights dim	Under charge Over charge Destroy battery Down time

(TASK STATEMENT) Inspect and Service Charging Circuit

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Transfer of energy from one form to another Resistance of materials to flow of electrical current Behavioral Science See appendix	Set of real numbers: Rationals Fundamental operations (Calculation) Basic measurement skills and concepts Instruments: volt amp meter Rate of charge Non geometric measurement: R.P.M., electricity Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Ignition System

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Tack-dwell meter Ohm meter Timing light Points and condenser Rotor and cap Wires Plugs Volt meter Cam lube Plug cleaner Distributor Coil Solder Solder iron Tape	Diagnose problems Remove and replace plugs Test plug wire Check rotor Remove and replace points Remove and replace condenser Adjust points Test coil output Set timing Check vacuum advance Check centrifical advance Test primary wire or resistor	Hazard High tension current causes shocks Safety Wear eye protection-sand blaster Make sure vehicle will not start accidentally.
DECISIONS	**CUES**	**ERRORS**
Determine if problem is ignition Determine what part of ignition is at fault	Engine missing Hard starting Regular P.M.	Working on wrong part

(TASK STATEMENT) Inspect and Service Ignition System

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. Work input, work output, friction and efficiency in simple machines Magnetic fields of force Transfer of energy from one form to another Resistance of materials to flow of electrical current Behavioral Science See Appendix	Set of real numbers: Rationals Fundamental operations (Calculation) Basic measurement skills and concepts Instruments: Tach-dwell meter Metric measurement Non geometric measurement: R.P.M., electricity Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Lighting Circuits

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Testlight Wire Terminals Switchs Fuses Lights Bulbs Flasher Solder Solder iron Tape	Inspect lights Test lights Test bulbs Test wires and terminals Test fuses and breakers Test light switch Test dimmer switch Test turn indicator switch Test stop light switch Remove and replace lights Remove and replace bulbs Remove and replace switchs Remove and replace fuses and breakers	Hazards If all lights are not working properly it could cause an accident If one part is not repaired correctly it could short and ruin another part
DECISIONS	**CUES**	**ERRORS**
Determine if all lights are working	Lights not working P.M. check	Poor visibility off vehicle No turn indicators

(TASK STATEMENT) Inspect and Service Lighting Circuits

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Magnetic fields of force Transfer of energy from one form to another Resistance of materials to flow of electrical current Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers Coding-given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Volt amp, ohm meter Measurement: Non geometric: Electricity Reading and interpreting tables, charts and graphs Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes emblems

(TASK STATEMENT) Inspect and Service Electric Shift Mechanism

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Test light Wire Terminals Switches Fuses and breakers Motor Solder Solder iron Tape	Test fuse or breaker Inspect wires and terminals Test switches Test motor	Wear eye protection

DECISIONS	CUES	ERRORS
Determine why differential will not shift	Ratio will not change	Poor gear selection Strain on other componets

(TASK STATEMENT) Inspect and Service Electric Shift Mechanism

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Magnetic fields of force Transfer of energy from one form to another Resistance of materials to flow of electrical current Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers Coding-given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Volt-ohm meter Measurement: Non-geometric: Electricity Reading and interpreting tables, charts, and graphs Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Electrical Accessories

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Testlight Wire Terminal Switches Fuses or breakers Relay Horn Wiper motor Wiper motor switch Heater motor Instruments Solder Solder iron Tape	Test horn relay, horn wiring & horn Remove and replace relay Remove and replace horn Repair wiring Test wiper motor, switch & breaker Test heater motor fuse, switch & motor Test gauges Test sendings units Remove and replace wiper motor, switch, and breaker Remove and replace heater motor fuse, switch and motor Remove and replace gauges Remove and replace sending units	Vehicle must have a warning device-HORN Horn and wipers must pass highway test
DECISIONS	**CUES**	**ERRORS**
Determine why horn will not work Determine why wiper motor will not work Determine why heater motor will not work	Horn will not work Wipers will not work Heater will not work Instruments will not work	Poor visibility Cold driver No warning system Ruin engine

(TASK STATEMENT) Inspect and Service Electrical Accessories

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Magnetic fields of force Transfer of energy from one form to another Resistance of materials to flow of electrical current Behavioral Science See Appendix	Set of real numbers: Rationals Uses of numbers Coding-given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: volt ohm meter Non-geometric measurement: Electricity Reading and interpreting tables, charts, and graphs Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

D Maintaining and Repairing Cooling System

1 Inspect and Service Coolant
2 Inspect and Service Belts and Hoses
3 Check and Service Water Pump
4 Inspect and Service Radiator and Cap
5 Test and Replace Thermostat
6 Service Water Filter and Inhibitor
7 Inspect and Service Shutterstat and Shutters
8 Inspect and Service Heater
9 Inspect and Service Fan

(TASK STATEMENT) Inspect and Service Coolant

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Hydrometer Water Anti-freeze Water can Radiator cap	Fill radiator to proper level Check freezing point of anti freeze Visually inspect radiator cap	Safety: Remove radiator cap slowly, hot water will spray out Hazard: Ethelene glycol is a poison

DECISIONS	CUES	ERRORS
Determine if water level is low Determine if freezing points is low enough. Determine if cap is physically good	Overheating Preventative maintenance service Water overflowing	Overheating Freezing Damage to other parts

(TASK STATEMENT) Inspect and Service Coolant

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Effect of heating and cooling on expansion of materials Effect of heating and cooling on state of matter Fluids under pressure Forces acting on a body immersed or floating in a liquid Transfer of heat from one body to another Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers Coding-given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Hydrometer Geometric measurement: volume Non-geometric measurement: anti-freeze and temperature Reading and interpreting tables, charts and graphs Basic algebra skills and concepts Uses of variables Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Belts and Hoses

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Belt tension gauge Coolant Hoses Belts Clamps Sealer Pressure tester	Visually inspect belts Visually inspect hoses Remove and replace belts Adjust belts Remove and replace hose clamps Remove and replace hoses Pressure test system	Release pressure on cooling system before pulling hoses Pull ignition key before working on hoses or belts

DECISIONS	CUES	ERRORS
Determine if belts need replaced Determine if hoses need replaced Determine if clamps can be reused	Frayed or loose belts Soft or hard and cracked hoses	Overheating Loss of coolant

(TASK STATEMENT) Inspect and Service Belts and Hoses

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Effect of heating and cooling on expansion of materials Effect of heating and cooling on state of matter Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental operations (Calculation) Basic measurement skills and concepts Instruments: tension gauge Geometric measurement: linear Non-geometric measurement: temperature, R.P.M. Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Check and Service Water Pump

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Gasket Sealant Pump Repair kit Press Pressure tester	Test pump for coolant leakage Inspect bearings Remove and replace belts Remove and replace pump Rebuild pump Remove and replace fan	Release pressure in cooling system before opening system Use care by radiator, easily damaged Use care in handling coolant
DECISIONS	**CUES**	**ERRORS**
Determine if pump is leaking Determine if bearings are worn	Leaking coolant Making noise	Loss of coolant Bearing failure and damage to other components

(TASK STATEMENT) Check and Service Water Pump

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Effect of heating and cooling on expansion of materials Effect of heating and cooling on state of matter Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape	Set of real numbers: Rationals Uses of numbers: without calculation Coding-given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal Basic measurement skills and concepts Instruments: pressure tester Geometric measurement: volume Non-geometric measurement: Pressure, coolant, R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic Fundamental Operation (Calculation)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Radiator and Cap

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Pressure tester Torch Solder Flux Cleaning chemicals	Visually inspect radiator Visually inspect cap Pressure test radiator Check cap release pressure Flush radiator Remove and replace radiator Solder leaks in radiator	Release pressure in system before working on system Wear eye protection Use care in handling coolant

DECISIONS	CUES	ERRORS
Determine if radiator needs replaced or serviced Determine if cap is correct pressure Determine if radiator needs repaired or recored	Leaking coolant Over heating	Leaks in cooling system Overheating

(TASK STATEMENT) Inspect and Service Radiator and Cap

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Effect of heating and cooling on expansion of materials Effect of heating and cooling on state of matter Transfer of heat from one body to another Transfer of energy from one form to another Inertia and momentum Relationship of force to distortion in an elastic body Behavioral Science See Appendix	Set of real numbers: Rationals Uses of numbers: without calculation Coding-given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal. Basic measurement skills and concepts Instruments: pressure tester Geometric measurement: volume Non-geometric measurement: pressure, coolant Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas: temperature, pressure, relationship Basic deductive logic Fundamental operations (Calculation)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, clarity of expression, logic Comprehension, detail/inference, progress reports, terminology Penmanship, spelling, terminology/general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Test and Replace Thermostat

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Thermostat Thermometer Gasket Sealer Seal	Check coolant temperature Remove and replace thermostat Test thermostat	Safety Release pressure before working on system. Hazard Wear eye protection

DECISIONS	CUES	ERRORS
Determine if thermostat is faulty Determine what engine temperature should be	Engine running too cold Engine running too hot	Engine overheating Engine running too cold No heat in cab

(TASK STATEMENT) Test and Replace Thermostat

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Effect of heating and cooling on expansion of materials Effect of heating and cooling on state of matter Transfer of energy from one form to another Transfer of heat from one body to another. Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: thermometer Metric measure Non-geometric measurement: temperature Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, terminology/general vocabulary, logic.
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Service Water Filter and Inhibitor

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Filter element Zinc plate Gaskets Clamps	Remove filter cover Remove filter Remove and check zinc plate Install new filter and zinc plate	Release pressure before working on system

DECISIONS	CUES	ERRORS
Determine if zinc plate need replaced. Determine if zinc plate is the right composition	P.M. check.	Electrolysis will attack the engine components

(TASK STATEMENT) Service Water Filter and Inhibitor

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Effect of heating and cooling on expansion Effect of heating and cooling on state of matter Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental operations (Calculation) Basic measurement skills and concepts Non-geometric: coolant Reading and interpreting tables, charts and graphs: specification chart Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Shutterstat and Shutters

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Filter element Shutterstat fluid Air cylinder Air hoses Shutter Lube Shutterstat	Visually inspect shutter Check operating temperature Remove and replace shutter Remove and replace air cylinder Service air lines Remove and replace shutterstat Adjust shutterstat Lube	Drain air tank Release pressure in cooling system before removing shutterstat Keep fingers out of shutter
DECISIONS Determine if shutter is operating at correct temperature	**CUES** Engine running too hot or cold	**ERRORS** Hot or cold engine operation

(TASK STATEMENT) Inspect and Service Shutterstat and Shutters

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Effect of heating and cooling on expansion of materials Effect of heating and cooling on state of matter Transfer of heat from one body to another Transfer of energy from one form to another Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Pressure gauge Geometric measurement: volume Non-geometric measurement: Pressure Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocaublary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Heater

TOOLS, EQUIPMENT, MATERIALS OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Pressure tester Torch Solder	Pressure test heater for leaks Remove and replace heater Flush heater Solder leaks	Safety: Use care with electrical connection Wear eye protection Release pressure before working on system

DECISIONS	CUES	ERRORS
Determine if heater core is leaking	Leaking coolant Poor circulation	Leaking coolant No heat in cab

(TASK STATEMENT) Inspect and Service Heater

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Effect of heating and cooling on expansion of materials Effect of heating and cooling on state of matter Transfer of energy from one form to another Transfer of heat from one body to another Behavioral Science See appendix	Set of real numbers: Rationals Fundamental operations (Calculation) Basic measurement skills and concepts Instruments: thermometer Non-geometric measurement: pressure, temperature. Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocaublary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
		Penmanship, spelling, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Fan

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Fan Clutch	Remove and replace fan Inspect fan for cracks Check thermostatic operation of fan	Safety Use care working close to radiator Hazard If fan blade flys off it can be quite destructive
DECISIONS Determine physical condition of fan Determine if operating temperature is correct	**CUES** Engine running hot Vibration	**ERRORS** Overheating Damage to other parts

(TASK STATEMENT) Inspect and Service Fan

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental operations (Calculation) Basic measurement skills and concepts: Instrument: ruler Geometric measurement: length Non-geometric measurement: temperature, R.P.M. Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, recognition of symbols, codes, emblems

E Maintaining and Repairing Brake Systems

1 Reline Brakes (Hydraulic)
2 Inspect and Service Power Units and Master Cylinder
3 Inspect and Service Lines (Hydraulic)
4 Reline Brakes (Air)
5 Inspect and Service Air Valves, Lines and Reservoir
6 Inspect and Service Air Compressor and Governor
7 Inspect and Service Anti - Skid System
8 Inspect and Service Air Chambers
9 Inspect and Service Parking Brake (Manual)

71

(TASK STATEMENT) Reline Brakes (Hydraulic)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Wheel jack Drum lathe Troque wrench Cylinder hone Rivet machine Pressure bleeder Bleeder valves Brake fluid Grease or oil Repair kits Lining and rivits Solvent	Jack vehicle Remove and replace wheels Inspect and pack bearings Remove and replace shoes Reline shoes Remove and replace wheel cylinders Repair wheel cylinders Bleed system Clean all parts as needed Adjust brakes	Safety: Wear eye protection, block vehicle Hazard: Brake fluid can harm finish

DECISIONS	CUES	ERRORS
Determine if lining needs replaced	Determine if wheel cylinders are re-buildable	Poor brakes

(TASK STATEMENT) Reline Brakes (Hydraulic)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials Fluids under pressure Transfer of heat from one body to another Transfer of heat from one form to another Inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental operations (Calculation) Baisc measurement skills and concepts Instruments: pressure gauge Geometric measurement: volume Non-geometric measurement: pressure, torque, brake fluid Reading and interpreting tables, charts and graphs: specification charts Basic algebra skills and concepts: uses of variables: in formulas Baisc deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic.
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination.

(TASK STATEMENT) Inspect and Service Power Units and Master Cylinder

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Repair kits Brake fluid Solvent Vacuum gauge Check valve Pressure bleeder	Test hydrovac Remove and replace hydrovac Rebuild hydrovac Inspect check valve Bleed system Remove and replace master cylinder Rebuild master cylinder	Safety: Wear eye protection Hazard: Brake fluid can harm finish
DECISIONS	**CUES**	**ERRORS**
Determine if hydrovac needs repair Determine if check valve holds vacuum Determine if master cylinder needs repaired	Hard stopping Pedal drop Leakage	Hard stopping

(TASK STATEMENT) Inspect and Service Power Units and Master Cylinder

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials Fluids under pressure Transfer of energy from one form to another Inertia and momentum Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic Arithmetic Skills and Concepts Estimation: rounding off decimals Basic measurement skills and concepts Instruments: pressure gauge Geometric measurement: volume Non-geometric measurement: pressure, brake fluid Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocaublary, logic
Viewing		Visual analysis, logic, color discrimination
Listening		Logic, noise discrimination

(TASK STATEMENT) Inspect and Service Lines (Hydraulic)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Cutting tool Flaring tool Brake fluid Pressure bleeder Fittings Hoses Tubing	Inspect steel lines Inspect hoses Remove and replace lines Remove and replace hoses Flare tubing Bleed system	Safety: Wear eye protection Be careful with brake fluid Hazard: Rust and dirt
DECISIONS Determine if lines need replaced Determine if hoses need replaced	**CUES** Leaking lines Leaking hoses Rusted lines Cracked hoses	**ERRORS** Loss of brakes while in service

(TASK STATEMENT) Inspect and Service Lines (Hydraulic)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials Fluids under pressure Transfer of heat from one body to another inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Geometric Measurement: volume (inches and feet) Reading and interpreting tables, charts, and graphs Brake fluid Non-geometric measurement: brake fluid Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic.
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination.

(TASK STATEMENT) Reline Brakes (Air)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Wheel jack Hydraulic jack Jack stands Torque wrench Rivit machine Grease or oil Lining and rivits Solvent Cam Wedge Slack adjuster	Jack vehicle Remove and replace wheels Inspect and pack bearings Remove and replace shoes Reline shoes Adjust brakes Service slack adjuster Service S-cam	Wear eye protection Drain air tank before working on any air components Make sure vehicle is supported properly

DECISIONS	CUES	ERRORS
Determine if wheel bearings are usable Determine if shoes need lining Determine if S-cam and bushings are usable	Vehicle hard to stop P.M. check Noise in brake	Poor brakes

(TASK STATEMENT) Reline Brakes (Air)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials Fluids under pressure Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation Coding-given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Pressure gauge Non-geometric measurement: R.P.M., torque, pressure Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination

(TASK STATEMENT) Inspect and Service Air Lines, Valves and Resevoir

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Flaring tool Cutting tool Tubing Hose Fittings Valves Pressure gauge	Inspect lines and hoses for leaks Remove and replace copper lines Remove and replace hoses Check treadle valve Check quick release valve Check relay valve Check front wheel limiting valve Remove and replace treadle valve Remove and replace release valve Remove and replace relay valve Remove and replace front wheel limiting valve Drain dirt and moisture from air tank	Wear eye protection Drain air tank before working on any component

DECISIONS	CUES	ERRORS
Determine if lines are leaking or deteriorated Determine if all valves are operating	Air leaks Deterioration Poor response	Poor brakes Failure while in service

(TASK STATEMENT) Inspect and Service Air Lines, Valves and Resevoir

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental operations (Calculation) Basic measurement skills and concepts Instruments: pressure gauge Geometric measurement: volume Non-geometric measurement: air pressure Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination

(TASK STATEMENT) Inspect and Service Air Compressor and Governor

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Valves Drive belt Lube Coolant Torque wrench Piston rings Cylinder hone Solvent Governor repair kit Pressure gauge	Inspect belt Check recovery capacity Check and adjust cut-in, cut-out point Remove and replace compressor Rebuild compressor Remove and replace governor Check lube oil lines	Wear eye protection Drain air tank before working on any air components

DECISIONS	CUES	ERRORS
Determine if compressor pumps enough volume Determine if air pressure is correct	Slow build up of air Low air pressure High air pressure	Inproper air pressure and/or volume

(TASK STATEMENT) Inspect and Service Air Compressor and Governor

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: pressure gauge Non-geometric measurement: air pressure Geometric measurement: area, volume Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination

(TASK STATEMENT) Inspect and Service Anti-skid System

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Ohm meter Test light Rotor Pick up Warning circuit Control monitor	Inspect indicator lights Inspect wires Check pickup Check and adjust air gap Remove and replace pick up Remove and replace rotor Remove and replace control monitor	Wear eye protection

DECISIONS	CUES	ERRORS
Determine if wiring is intact. Determine if air gap is correct Determine if monitor is operating	Indicator light P.M. service	Skid while stopping

(TASK STATEMENT) Inspect and Service Anti-skid System

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. Work input, work output, friction and efficiency in simple machines Magnetic fields of force Transfer of energy from one form to another Inertia and momentum Effects of friction on work processes and product quality Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Use of computing devices and mechanical aids: Computers Basic measurement skills and concepts Instruments: ohm meter Non-geometric measurement: R.P.M., electricity Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination.
Viewing		Visual analysis, logic, color discrimination

(TASK STATEMENT) Inspect and Service Air Chambers

TOOLS, EQUIPMENT, MATERIALS OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Press Repair kit Diaphragm Spring Lube	Inspect chambers for leaks Remove and replace chambers Remove and replace diaphragm Remove and replace spring brake chamber Rebuild spring brake	Wear eye protection Drain air tank before working on any air component. Use extreme care in working on spring brake chamber
DECISIONS	**CUES**	**ERRORS**
Determine why chamber is leaking Determine why spring brake not holding	Air leaking Poor brake No emergency brake	Poor brakes No emergency brake

(TASK STATEMENT) Inspect and Service Air Chambers

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. Work input, work output, friction and efficiency in simple machines Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations: (Calculation) Basic measurement skills and concepts Non-geometric measurement: pressure Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination

(TASK STATEMENT) Inspect and Service Parking Brake (Manual)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Lining and rivits Cable Lever Linkage Drum Lube	Inspect linkages Remove and replace brake drum Remove and replace shoes Reline shoes Adjust brake Remove and replace cable Remove and replace lever Rebuild lever	Wear eye protection, block vehicle

DECISIONS	CUES	ERRORS
Determine if brake needs adjusted Determine if linkages are operating correctly Determine if brake needs relined	Park brake will not hold	Park brake will not hold

(TASK STATEMENT) Inspect and Service Parking Brake (Manual)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Foot pound torque Non-geometric measurement: torque Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination

F Maintaining and Repairing Driveline

1 Inspect and Service Clutch
2 Service and Repair Transmission (Manual)
3 Service and Repair Transmission (Automatic)
4 Inspect and Service Shift Mechanism
5 Inspect and Service Driveshaft and Joints
6 Service and Repair Differential (Single-Speed)
7 Service and Repair Differential (Two - Speed)
8 Service and Repair Power Divider
9 Inspect and Service Axle
10 Service and Repair Power Take-Off

(TASK STATEMENT) Inspect and Service Clutch

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Transmission jack Pilot shaft Clutch Pressure plate Throw out bearing Pilot bearing Lube Puller Torque wrench Dial indicator	Diagnose clutch problem Remove and replace drive shaft Remove and replace transmission Remove and replace clutch Remove and replace flywheel Reface flywheel Adjust clutch Lube linkages	Wear eye protection Support transmission on jack properly Support engine properly Block vehicle

DECISIONS	CUES	ERRORS
Determine if clutch needs replaced Determine if flywheel needs refaced	Clutch slipping Noise	Short clutch life

(TASK STATEMENT) Inspect and Service Clutch

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental operations: (Calculation) Basic measurement skills and concepts Instruments: Thickness gauge Metric measure Geometric measurement: length Non-geometric measurement: R.P.M. Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/ general vocabulary, logic Comprehension, detail/inference, progress reports, terminology Penmanship, spelling, reports, terminology/general vocabulary, logic Reports, appropriate diction Visual analysis, logic

(TASK STATEMENT) Service and Repair Transmission (Manual)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Transmission jack Drain pan Solvent Puller Torque wrench Grease Gear oil Gears Bearings Seals Dial indicator Snapring pliers	Diagnose transmission problem Remove and replace drive shaft Remove and replace transmission Clean and inspect transmission Rebuild transmission Rebuild cover assembly	Wear eye protection Support transmission on jack properly Block vehicle
DECISIONS	**CUES**	**ERRORS**
Determine if transmission needs repaired Determine what gears need replaced	Noisy operation Will not shift No operations	Noisy operation Short life

(TASK STATEMENT) Service and Repair Transmission (Manual)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Transfer of energy from one form to another Inertia and momentum Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental operations (Calculation) Basic measurement skills and concepts Instruments: Thickness gauge Geometric measurement: angles (Helix), length Non-geometric measurement: R. P. M. Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading		Terminology/general vocabulary, logic Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening Viewing		Reports, appropriate diction Visual analysis, logic

(TASK STATEMENT) Service and Repair Transmission (Automatic)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Transmission jack Drain pan Solvent Puller Torque wrench Gauges Clutches Gears Seals Bearings Dial indicator Snapring pliers Filter A.T.F.	Diagnose transmission problems Remove and replace driveshaft Remove and replace transmission Clean and inspect transmission Rebuild transmission	Wear eye protection Support transmission on jack properly Block vehicle

DECISIONS	CUES	ERRORS
Determine if transmission needs adjusted or rebuilt Determine which parts are reusable	Noisy operation Will not shift No operation	Noisy operation Erratic shifting

(TASK STATEMENT) Service and Repair Transmission (Automatic)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. Work input, work input, friction and efficiency in simple machines Fluids under pressure Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Effects of friction on work processes and product quality Behavioral Science See Appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic Measurement Skills and Concepts Instruments: Pressure gauge Geometric measurement: volume Non-geometric measurement: Speed, R.P.M., torque, pressure Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Reports, appropriate diction
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Service Shift Mechanism

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Snapring pliers Air Lines Air cylinder Linkages Lube Air filter	Diagnose shifter problems Remove and replace linkages Adjust linkages Remove and replace air lines Remove and replace air switch Lube joints Remove and replace air filter	Wear eye protection Drain air before working on system

DECISIONS	CUES	ERRORS
Determine if linkage needs repaired or replaced	Hard shifting Loose linkage Slow shifting No shifting	Hard shifting Slow shifting No shifting Loose linkage

(TASK STATEMENT) Inspect and Service Shift Mechanism

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: pressure gauge Non-geometric measurement: pressure, R.P.M. Reading and interpreting tables, charts, graphs: specification charts Basic Deductive Logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Reports, appropriate diction
Viewing		Visual analysis, logic.

(TASK STATEMENT) Inspect and Service Drive Shaft and Joints

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Press Snapring pliers Lube Protractor V-Joints Solvent	Inspect joints Remove and replace drive shaft Remove and replace V-Joints Align V-Joints Lube V-Joints Check drive shaft angle	Wear eye protection Block vehicle Pull ignition key
DECISIONS Determine if shaft is bent Determine if joints are worn	**CUES** Vibration Loose joints	**ERRORS** Vibration Drive shaft failure

(TASK STATEMENT) Inspect and Service Drive Shaft and Joints

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Uses of numbers without calculation: Ratio Basic measurement skills and concepts Instrument: protractor Geometric measurement: Angle Non-geometric measurement: R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, detail/inference, progress reports, terminology Penmanship, spelling, reports, terminology/general vocabulary, logic Reports, appropriate diction Visual analysis, logic

(TASK STATEMENT) Service and Repair Differential (Single-speed)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Drain pan Differential jack Gears Bearings Gaskets Seals Gear oil Solvent Snapring pliers	Diagnose differential Remove and replace axles Remove and replace driveshaft Remove and replace differential Rebuild differential Fill differential	Wear eye protection Block vehicle Use safe jacking procedure
DECISIONS Determine if differential needs repaired Determine which parts can be reused	**CUES** Noisy operation No operation	**ERRORS** Noisy operation Short differential life

(TASK STATEMENT) Service and Repair Differential (Single-speed)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Fluids under pressure Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Micrometer Geometric measurement: length, angle Non-geometric measurement: R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocaublary, logic.
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Reports, appropriate diction
Viewing		Visual analysis, logic

(TASK STATEMENT) Service and Repair Differential (Two speed)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Drain pan Differential jack Gears Bearings Gaskets Seals Gear oil Solvent Snapring pliers	Diagnose differential Remove and replace axles Remove and replace driveshaft Remove and replace differential Remove and replace shift unit Rebuild shift unit Lube	Wear eye prote[illegible] Block vehicl[illegible] Use safe [illegible]king procedure

DECISIONS	CUES	ERRORS
Determine if differential needs repair Determine which parts can be reused Determine why differential will not shift	Noisy operation No operation Will not shift	Noisy operation Short differential life Will not shift

(TASK STATEMENT) Service and Repair Differential (Two-speed)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. Work input, work output, friction and efficiency in simple machines Fluids under pressure Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Micrometer Geometric measurement: length, angle Non-geometric measurement: R.P.M. Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, logic.
Reading		Comprehension, detail/inference, progress reports, terminology.
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Reports, appropriate diction.
Viewing		Visual analysis, logic, recognition of symbols, cues, emblems

(TASK STATEMENT) Service and Repair Power Divider

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Drain pan Differential jack Gears Bearings Gaskets Seals Gear oil Solvent Snapring pliers	Diagnose power divider problems Remove and replace power divider Rebuild power divider Check shift mechanism Remove and replace drive shaft Lube	Wear eye protection Block vehicle Pull ignition key

DECISIONS	CUES	ERRORS
Determine if unit will engage Determine which parts are damaged	Noisy operation Will not shift	Unequal torque distribution

(TASK STATEMENT) Service and Repair Power Divider

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Fluids under pressure Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: micrometer Geometric measurement: Length, angle Non-geometric measurement: R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, detail/inference, progress reports, terminology Penmanship, spelling, reports, terminology/general vocabulary, logic Reports, appropriate diction Visual analysis, logic

(TASK STATEMENT) Inspect and Service Axle

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Basic tool kit Torque wrench Seal or gasket Gear oil Solvent	Remove and replace axle bolts Remove and replace axle Inspect axle Remove and replace seal Fill oil reservoir for wheel bearings	Wear eye protection Block vehicle Use care in removing axle

DECISIONS	CUES	ERRORS
Determine if axle is good	Drive shaft turns, wheel does not	

(TASK STATEMENT) Inspect and Service Axle

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Fluids under pressure Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape. Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Thickness gauges Metric measure Geometric measurement: length Non-geometric measurement: Torque, lube Reading and interpreting tables, charts, and graphs: specification chart Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Reports, appropriate diction
Viewing		Visual analysis, logic

(TASK STATEMENT) Service and Repair Power Take-off

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Gaskets U-joints Bearings Gears Shift mechanism Solvent Snapring pliers	Inspect power take-off Remove and replace drive shaft Drain and refill gear oil Remove and replace power take off Rebuild power take off Adjust shift linkage	Wear eye protection Pull ignition key
DECISIONS Determine if unit is damaged Determine if linkage is adjusted correctly	**CUES** Noisy operation Will not engage	**ERRORS** Power take-off will not work. Power take-off will not engage.

(TASK STATEMENT) Service and Repair Power Take-off

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines. Fluids under pressure. Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum. Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Micrometer Geometric measurement: Length, angle. Non-geometric measurement: R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, detail/inference, progress reports, terminology. Penmanship, spelling, reports, terminology/general vocabulary, logic Reports, appropriate diction. Visual analysis, logic.

G Maintaining and Repairing Steering Systems

1 Service and Repair Manual Steering Box
2 Service and Repair Power Steering (Hydraulic)
3 Service and Repair Air Assist Steering
4 Inspect and Service Steering Linkages

(TASK STATEMENT) Service and Repair Manual Steering Box

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Bearings Gaskets Seals Worm Cross shaft Grease Gear oil Torque wrench Solvent Puller Snap ring pliers	Diagnose steering problem Remove and replace box Rebuild box Adjust box Fill with gear oil	Wear eye protection

DECISIONS	CUES	ERRORS
Determine if box needs adjusted or repaired	Too much play in steering Hard steering	Steering box failure

(TASK STATEMENT) Service and Repair Manual Steering Box

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Transfer of energy from one form to another Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Thickness gauge Geometric measurement: Length, angle Non-geometric measurement: Lube Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS		
PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading		Terminology/general vocabulary, logic Comprehension, detail/inference, terminology
Writing		Penmanship, spelling, reports, terminology, logic
Listening		Logic, Noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Service and Repair Power Steering (Hydraulic)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Bearings Gaskets Seals Belts A.T.F. Pullers Snapring pliers Lines Hoses Solvent Torque wrench	Diagnose problem Remove and replace box Rebuild box Remove and replace pump Rebuild pump Remove and replace hoses Remove and replace belts Remove and replace slave cylinder Rebuild slave cylinder	Safety Wear eye protection, pull ignition key Hazard Fluid under pressure
DECISIONS Determine if box needs rebuilt Determine if pump needs rebuilt	**CUES** Leaking A.T.F. No power assist Uneven operation	**ERRORS** Leaking Erratic operation

(TASK STATEMENT) Service and Repair Power Steering (Hydraulic)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Fluids under pressure Transfer of energy from one form to another Inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic Measurement Skills and Concepts Instruments: Thickness gauge Geometric measurement: Length, angle Non-geometric measurement: Lube Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic Basic algebra skills and concepts uses of variables: In formulas

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, logic
Reading		Comprehension, detail/inference, terminology
Writing		Penmanship, spelling, reports, terminology, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination

(TASK STATEMENT) Service and Repair Air Assist Steering

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Fittings Hoses Seals Torque wrench	Inspect air loses Remove and replace hoses Remove and replace slave cylinder Rebuild slave cylinder	Wear eye protection Drain air tank before working on unit

DECISIONS	CUES	ERRORS
Determine if air supply is sufficient Determine if cylinder needs repaired	No power assist	Difficult steering

(TASK STATEMENT) Service and Repairing Air Assist Steering

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. Work input, work output, friction and efficiency in simple machines Transfer of energy from one form to another Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: pressure gauge. Geometric measurement: Volume Non-geometric measurement: Pressure, torque, lube Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, detail/inference, terminology Penmanship, spelling, reports, terminology, logic Logic, noise discrimination Visual analysis, logic

(TASK STATEMENT) Inspect and Service Steering Linkages

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Drag link socket Tie rod splitter Cottor pins Tie rod ends Drag link repair kits Puller Torque wrench	Inspect linkage Remove and replace drag link Remove and replace tie rod Remove and replace idler arm Remove and replace pitman arm	Wear eye protection Elock vehicle

DECISIONS	CUES	ERRORS
Determine if joints have excessive play	Excessive play in-steering	Loose steering

(TASK STATEMENT) Inspect and Service Steering Linkages

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Transfer of energy from one form to another Inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: torque wrench Non-geometric measurement: Torque, angle, lube Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, logic
Reading		Comprehension, detail/inference, terminology
Writing		Penmanship, spelling, reports, terminology, logic
Listening		Logic, noise discrimination
Viewing		Visual analysis, logic

H Maintaining and Repairing Suspension

1 Inspect and Replace Leaf Springs
2 Inspect and Replace Coil Springs and Shocks
3 Inspect and Replace Ball Joints
4 Repair and Service King Pins and Bushings
5 Inspect and Service Torque Arms and Beams
6 Inspect and Repair Air Suspension
7 Inspect and Replace Torsion Bars

(TASK STATEMENT) Inspect and Replace Leaf Springs

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Jack Jack stands 3/4" drive socket Torque wrench Pins Bushings Lube Fittings V-Bolt Brackets Pads Shackles	Inspect spring height Inspect for broken plates Inspect pins Inspect pads and brackets Jack vehicle Remove and replace spring Lube	Wear eye protection Block vehicle Use care in listing heavy weights
DECISIONS Determine if spring height is correct Determine if pins, pads and brackets need replaced	**CUES** Sagging body Missing plates	**ERRORS** Damage to other parts

(TASK STATEMENT) Inspect and Replace Leaf Springs

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Transfer of energy from one form to another Inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: Linear Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Replace Coil Springs and Shocks

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Jack Jack stands Splitter Spring Pads Shocks Bushings Lube	Inspect spring height Inspect shocks Remove and replace shocks Remove and replace spring	Wear eye protection Block vehicle Use care in compressing spring
DECISIONS Determine if spring height is correct Determine if shocks need replaced	**CUES** Vehicle sagging Unstable ride	**ERRORS** Vehicle height wrong Poor steering

(TASK STATEMENT) Inspect and Replace Coil Springs and Shocks

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Fluids under pressure Transfer of energy from one form to another Inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic Measurement Skills and Concepts Instruments: ruler Measurement: Geometric : Linear Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Replace Ball Joints

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Splitter Jack Jack stands Torque wrench Ball joints Fittings Lube Cottor pins	Inspect ball joints Remove and replace ball joints Lube joints	Wear eye protection Block vehicle Use care with a compressed spring

DECISIONS	CUES	ERRORS
Determine if ball joints need replaced	Loose joints, tire wear	Broken suspension

(TASK STATEMENT) Inspect and Replace Ball Joints

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Transfer of heat from one body to another Inertia and momentum. Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body. Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic Measurement Skills and Concepts Non-geometric: Torque, lube Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Repair and Service King Pins and Bushings

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Jack Jack stands Press Reamer Torque wrench Fittings Grease King pin, bushing set	Inspect king pins Jack vehicle Remove and replace wheel Remove and replace brakes Remove and replace spindle Remove and replace bushings Lube	Wear eye protection Block vehicle
DECISIONS Determine if pins and bushing need replaced	**CUES** Tire wear Wheel alignment	**ERRORS** Incorrect wheel alignment Hard steering

(TASK STATEMENT) Repair and Service King Pins and Bushings

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Transfer of energy from one form to another Inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Non-geometric measurement: Torque, lube Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Service Torque Arms and Beams

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit 3/4" drive and socket Jack Jack stands Press Arms Ends Shims Lube Bushings Pins Shaft	Inspect arms Remove and replace arms Lube arms Inspect walking beam Remove and replace walking beam Remove and replace walking beam bushings	Wear eye protection Block vehicle Use care in lifting heavy weights
DECISIONS	**CUES**	**ERRORS**
Determine if play in arms is excessive	Play in arms	Loose suspension and drive line

(TASK STATEMENT) Inspect and Service Torque Arms and Beams

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage. Work input, work output, friction and efficiency in simple machines. Transfer of energy from one form to another Inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Non-geometric measurement: Torque, lube Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Repair Air Suspension

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Air gauge Air bag Hoses Fittings Control valve	Inspect air bags Inspect shocks Remove and replace air bag Remove and replace air lines Remove and replace control valve	Wear eye protection Drain air tank before working on system

DECISIONS	CUES	ERRORS
Determine if air pressure is correct	Leaking air bag Leaking lines	Poor suspension

(TASK STATEMENT) Inspect and Repair Air Suspension

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Work input, work output, friction and efficiency in simple machines Transfer of energy from one form to another. Transfer of heat from one body to another. Inertia and momentum. Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (calculation) Basic measurement skills and concepts Instruments: Pressure gauge Geometric measurement: Area, volume Non-geometric measurement: Pressure Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Replace Torsion Bars

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Jack Jack stand Tension bar Adjusting bolts	Inspect vehicle height Remove and replace tension bar Adjust vehicle height	Wear eye protection Block vehicle

DECISIONS	CUES	ERRORS
Determine if vehicle height is correct	Vehicle height too low Broken tension bars	Incorrect spring rate

(TASK STATEMENT) Inspect and Replace Torsion Bars

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Transfer of energy from one form to another Inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rational Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: Length, angle Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic.
Reading		Comprehension, detail/inference, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic.
Listening		Auditory discrimination, logic, noise discrimination.
Viewing		Visual analysis, logic

I Maintaining and Repairing Exhaust Systems

1 Inspect and Replace Muffler
2 Inspect and Replace Exhaust Pipes
3 Inspect and Replace Exhaust Manifolds
4 Insepct and Service Turbocharger

(TASK STATEMENT) Inspect and Replace Muffler

TOOLS, EQUIPMENT, MATERIALS OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Torch Muffler Clamps	Inspect muffler Remove and replace muffler Monitor sound level	Wear eye protection Keep a fire extinguisher handy

DECISIONS	CUES	ERRORS
Determine if muffler needs replaced	Noise Leaking Rust	Too loud Restriction

(TASK STATEMENT) Inspect and Replace Muffler

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Effect of heating and cooling on expansion of materials Transfer of energy from one form to another Transfer of heat from one body to another Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation :Ratio Fundamental Operations (Calculation) Basic Measurement Skills and Concepts Instruments: ruler Geometric measurement: Length, volume Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, progress reports, terminology Penmanship, spelling, terminology/general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic

(TASK STATEMENT) Inspect and Replace Exhaust Pipes

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic Tool Kit Torch Pipes Clamps	Inspect pipes Remove and replace pipes	Wear eye protection Keep a fire extinguisher handy

DECISIONS	CUES	ERRORS
Determine if exhaust pipes need replaced	Noise Leaking Rust	Broken pipes Damage to other componets

(TASK STATEMENT) Inspect and Replace Exhaust Pipes

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Effect of heating and cooling on expansion of materials Transfer of energy from one form to another Transfer of heat from one body to another Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Caculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: Length, volume Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, progress reports, terminology Penmanship, spelling, terminology/general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic

(TASK STATEMENT) Inspect and Replace Exhaust Manifolds

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Torch Torque wrench Gaskets Clamps	Inspect manifold Remove and replace pipe Remove and replace manifold	Wear eye protection Keep a fire extinguisher handy

DECISIONS	CUES	ERRORS
Determine if gaskets are leaking or manifold is cracked	Leaking exhaust	Cracked manifold

(TASK STATEMENT) Inspect and Replace Exhaust Manifolds

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials Transfer of heat from one body to another Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: Length, volume Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

71

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, logic
Reading		Comprehension, progress reports, terminology
Writing		Penmanship, spelling, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Service Turbo Charger

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Dial indicator Torque wrench Pyrameter Tachometer Puller Press Seals Gaskets Bearings Wheels Shaft Oil lines Coolant lines Clamps Fittings	Inspect turbo charger connection Remove and replace turbo charger Rebuild turbo charger	Wear eye protection

DECISIONS	CUES	ERRORS
Determine if R.P.M. is correct Determine which parts need replaced	Noisy operation P.M. check	Turbo charger failure Poor performance

(TASK STATEMENT) Inspect and Service Turbo Charger

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Effect of heating and cooling on expansion of materials Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behaviorial Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic arithmetic skills and concepts Estimation: Guess and check method (clearance) Basic measurement skills and concepts Instruments: Thickness gauges, pyrometer. Geometric measurement: Volume, length Non-geometric measurement: Torque, temperature, R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic. Comprehension, progress reports, terminology Penmanship, spelling, terminology/general vocabulary, logic. Auditory discrimination, logic, noise discrimination. Visual analysis, logic

J Maintaining and Repairing Hydraulic Systems

1 Service and Repair Hydraulic Pumps
2 Inspect and Repair Hydraulic Lines and Reservoirs
3 Inspect and Repair Hydraulic Control Valves
4 Service and Repair Hydraulic Cylinders

(TASK STATEMENT) Service and Repair Hydraulic Pumps

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Pressure gauge Torque wrench Dial indicator Pipe wrench Micrometer Gears Bearings Gaskets Sealer Oil Seals Solvent	Diagnose problem in pump Remove and replace pump Disassemble and clean Inspect Rebuild pump	Wear eye protection Pull ignition key

DECISIONS	CUES	ERRORS
Determine if pump needs rebuilt Determine if pressure and volume are correct	Leaking oil Slow operation	Pump failure

(TASK STATEMENT) Service and Repair Hydraulic Pumps

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Fluids under pressure Transfer of energy from one form to another Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers : Rationals Fundamental Operations (Calculation) Basic Measurement Skills and Concepts Instruments: pressure gauge, thickness gauges. Geometric measurement: Length, volume Non-geometric measurement: Pressure, oil, R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Repair Hydraulic Lines and Reservoirs

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Pressure gauge Torque wrench Flaring tool Tubing cutter Pipe wrench Lines Hoses Gaskets Fittings Sealer Solvent Oil	Visually inspect lines Remove and replace lines Make up lines Inspect reservoir Remove and replace reservoir Remove and replace filter	Safety Wear eye protection Hazard Fluid under pressure can be dangerous
DECISIONS Determine if lines or hoses need replaced Determine if lines or fittings are leaking	**CUES** Leaking oil Frayed lines Bent tubes	**ERRORS** Line or hose failure

(TASK STATEMENT) Inspect and Repair Hydraulic Lines and Reservoirs

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Fluids under pressure Transfer of energy from one form to another Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: pressure gauge, thickness gauges Geometric measurement: length, volume Non-geometric measurement: Pressure, oil, R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Repair Hydraulic Control Valves

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Valves Repair kit Linkage Lube	Check control valve Remove and replace valve Clean and repair valve Adjust linkage	Safety Wear eye protection Hazard Fluid under pressure can be dangerous
DECISIONS Determine if valves are operating. Determine if linkage is adjusted correctly	**CUES** Unit not working Valves leaking	**ERRORS** Unit will not work

(TASK STATEMENT) Inspect and Repair Hydraulic Control Valves

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Fluids under pressure Transfer of energy from one form to another Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers : Rationals Fundamental Operations (Calculation) Basic Measurement Skills and Concepts Instruments: pressure gauge, thickness gauges. Geometric measurement: Length, volume Non-geometric measurement: Pressure, oil, R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic algebra skills and concepts Uses of variables in formulas Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic.
Reading		Comprehension, detail/inference, progress reports
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination.
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Service and Repair Hydraulic Cylinders

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Pipe wrench Vise Hone Dial indicator Micrometer Seals Gaskets Packing Rings Piston Sealer	Inspect cylinder Remove and replace cylinder Rebuild cylinder	Safety: Wear eye protection Hazard: Fluid under pressure can be dangerous
DECISIONS Determine if cylinder needs replaced Determine if cylinder can be rebuilt	**CUES** Leaking oil Scored cylinder	**ERRORS** Cylinder failure

(TASK STATEMENT) Service and Repair Hydraulic Cylinders

SCIENCE

Physical Science
Simple machines used to gain mechanical advantage
Work input, work output, friction and efficiency in simple machines
Fluids under pressure
Transfer of energy from one form to another
Relationship of force to distortion in an elastic body
Resistance of materials to change in shape

Behavioral Science
See appendix

MATH – NUMBER SYSTEMS

Set of real numbers: Rationals
Fundamental Operations (Calculation)
Basic Measurement Skills and Concepts
- Instruments: pressure gauge, thickness gauges
- Geometric measurement: Length, volume
- Non-geometric measurement: Pressure, oil, R.P.M.
- Reading and interpreting tables, charts, and graphs: specification charts

Basic algebra skills and concepts
- Uses of variables in formulas

Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, clarity of expression, logic
Reading		Comprehension, detail/inference, progress reports
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

K Maintaining and Repair Transport Refrigeration and Air Conditioning Systems

1 Inspect and Repair Refrigeration Compressor
2 Test and Charge R-12
3 Inspect and Repair Drive Clutch
4 Maintain and Service Auxilary Engine
5 Inspect and Service Condensing Unit
6 Inspect and Service Controlls

(TASK STATEMENT) Inspect and Repair Refrigeration Compressor

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Dial indicator Torque wrench Puller Press Micrometer Compound pressure gauge Gaskets Bearings Seals Valves Rings Sealer Compressor oil Solvent	Diagnose compressor problems Remove and replace compressor Clean and inspect Rebuild compressor	Safety: wear eye protection, use well ventilated area Hazard: R-12 under pressure, liquid R-12 can cause frost bite

DECISIONS	CUES	ERRORS
Determine if compressor needs rebuilt Determine which parts can be reused	Poor cooling Noisy operation	Load spoilage

(TASK STATEMENT) Inspect and Repair Refrigeration Compressor

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Effect of heating and cooling on expansion of materials Effect of heating and cooling on state of matter Fluids under pressure Transfer of energy fro one form to another Transfer of heat from one body to another Realtionship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: thermometer Geometric measurement: Volume Non-geometric measurement: Torque, temperature, R. P. M. Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, logic
Reading		Comprehension, detail/inference, terminology
Writing		Penmanship, spelling, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Test and Change R-12

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Compound pressure gauge Leak detector Evaluator pump R-12	Check head pressure Check low side pressure Evacuate system Charge system Check for leaks	Safety: Wear eye protection, use well ventilated area. Hazard: R-12 is under pressure, liquid R-12 can cause frost bite

DECISIONS	CUES	ERRORS
Determine if high pressure is correct Determine if low pressure is correct	No cooling Continuous operation	Load spoilage

(TASK STATEMENT) Test and Change R-12

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Effect of heating and cooling on expansion of materials Effect of heating and cooling on state of matter Fluids under pressure Transfer of heat from one body to another Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: Thermometer Geometric measurement: Volume Non-geometric measurement: Torque, temperature, R.P.M. Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, detail/inference, terminology Penmanship, spelling, terminology/general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Repair Drive Clutch

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Puller Snapring pliers Press Clutch Shoes Drum Springs Bearings Solvent	Check R. P. M. 's to engage clutch Inspect for slippage Remove and replace clutch Rebuild clutch	Safety Wear eye protection
DECISIONS	**CUES**	**ERRORS**
Determine if clutch engages properly Determine if clutch is slipping Determine if clutch will disengage	No cooling Noisy operation	Load spoilage

(TASK STATEMENT) Inspect and Repair Drive Clutch

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction, and efficiency in simple machines Effect of heating and cooling on expansion of materials Magnetic fields of force Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: thermometer Geometric measurement: Volume Non-geometric measurement: Torque, temperature, R.P.M. Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, detail/inference, terminology Penmanship, spelling, terminology/general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Maintain and Service Auxiliary Engine

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Lube oil Filters Ignition parts Coolant	Check coolant Check oil Tune up Change oil Change filter	Wear eye protection
DECISIONS Determine when P.M. should be done	**CUES** P.M. service	**ERRORS** Engine break down

(TASK STATEMENT) Maintain and Service Auxiliary Engines

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Effect of heating and cooling on expansion of materials Fluids under pressure Transfer of energy from one form to another Transfer of heat from one body to another Inertia and momentum Behavioral Science See appendix	Set of real numbers: Rational Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: hydrometer Non-geometric measurement: Oils Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, detail/inference, terminology Penmanship, spelling, terminology/general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

(TASK STATEMENT) Inspect and Service Condensing Unit

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Compound pressure gauge Torch Leak detector Thermometer Expansion valve R-12 Solder Vibra-sorber Valves	Test condenser unit for leaks Test evaporator unit for leaks Test expansion valve operation Pump down system Repair leaks Evacuate system Re-check unit operation	Wear eye protection

DECISIONS	CUES	ERRORS
Determine where leaks are Determine if expansion valve is operating properly	Poor cooling	Load spoilage

(TASK STATEMENT) Inspect and Service Condensing Unit

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Effect of heating and cooling on expansion of materials Effect of heating and cooling on state of matter Fluids under pressure Transfer of heat from one body to another Transfer of heat from one form to another Inertia and momentum Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: thermometer Geometric measurement: Volume Non-geometric measurement: Torque, temperature, R. P. M. Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, detail/inference, terminology. Penmanship, spelling, terminology/general vocabulary, logic. Auditory discrimination, logic, noise discrimination Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems.

(TASK STATEMENT) Inspect and Service Controls

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Thermometer Ohm meter Solder iron Wires Controls Relays Fuses Terminals Solder Tape	Inspect relays Inspect wires Inspect fuses Inspect thermostat Repair wires Remove and replace fuses Remove and replace thermostat	Wear eye protection

DECISIONS	CUES	ERRORS
Determine if controls are faulty Determine which part of controls are faulty	Will not operate Will not reach required temperature	Improper cooling

(TASK STATEMENT) Inspect and Service Controls

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Effect of heating and cooling on expansion of materials. Magnetic fields of force Fluids under pressure Resistance of materials to flow of electrical current Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: thermometer, ohm meter Geometric measurement: Length, volume Non-geometric measurement: Torque, temperature, R.P.M., electricity Reading and interpreting tables, charts and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, detail/inference, terminology Penmanship, spelling, terminology/general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic, color discrimination, recognition of symbols, codes, emblems

L Maintaining and Repairing Chassis Components

1 Inspect and Service Fifth Wheel and King Pin
2 Inspect and Service Landing Gear
3 Inspect and Service Slider (Tandem)

(TASK STATEMENT) Inspect and Service Fifth Wheel and King Pin

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Torch Calipers Hoist Pads Jaws Bushings Shaft Ground strap Grease	Check jaws for play Check shaft Check ground strap Remove and replace fifth wheel Rebuild fifth wheel Lube Inspect trailer king pin Remove and replace trailer king pin	Wear eye protection Fire extinguisher

DECISIONS	CUES	ERRORS
Determine if jaw fit is too loose	Will not lock Loose connection	Dropped trailers

(TASK STATEMENT) Inspect and Service Fifth Wheel and King Pin

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Effects of friction on work processes and product quality Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations: (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: Length Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, terminology Penmanship, spelling, terminology/general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic

(TASK STATEMENT) Inspect and Service Landing Gear

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Torch Puller Press Gears Bearings Seals Gaskets Shafts Handle Wheels Lube	Inspect landing gear operations Remove and replace landing gear Rebuild landing gear Adjust landing gear Lube	Eye protection Fire extinguisher Use care in lifting heavy weights

DECISIONS	CUES	ERRORS
Determine why landing gear will not operate Determine which parts need replaced	Gear will not raise or lower Hard operation	Broken landing gear

(TASK STATEMENT) Inspect and Service Landing Gear

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Effects of friction on work processes and product quality Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations: (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: Length Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, terminology Penmanship, spelling, terminology/general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic

(TASK STATEMENT) Inspect and Service Slider (Tandem)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Torch Pins Levers	Inspect carriage Inspect rails Inspect lock pins Inspect operating levers Repair carriage Repair rails Remove and replace lock pins Remove and replace operating levers Adjust levers Lube	Wear eye protection Keep hands clear while operating
DECISIONS Determine if lock pins are adjusted correctly Determine if parts are worn past limits	**CUES** Will not slide Loose fit	**ERRORS** Slider could move while on highway

(TASK STATEMENT) Inspect and Service Slider (Tandem)

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Effects of friction on work processes and product quality Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations: (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: Length Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, terminology Penmanship, spelling, terminology/ general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic

M Maintaining and Repair Cab and Accessories

1 Inspect and Service Doors
2 Inspect and Service Windows
3 Inspect and Service Hood
4 Inspect and Service Seat
5 Inspect and Service Ventilators
6 Inspect and Service Mirrors
7 Inspect and Service Speedometer and Tachometer

(TASK STATEMENT) Inspect and Service Doors

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Hinges Latches Handles Pins Lube	Check door operation Remove and replace hinges Remove and replace lock Remove and replace striker plate Remove and replace handles Lube Adjust door	Wear eye protection

DECISIONS	CUES	ERRORS
Determine if components need replaced Determine if door is adjusted correctly	Door will not close Door will not open Door rattles	Door will not fit and operate correctly

(TASK STATEMENT) Inspect and Service Doors

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: length Non-geometric measurement: Lube Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading		Terminology/general vocabulary, logic. Comprehension, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Service Windows

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Glass Regulator Handles Chanels Lube Clips	Remove and replace handles Remove and replace door panels Remove and replace glass Remove and replace chanels Lube Adjust window	Wear eye protection Be careful of broken glass

DECISIONS	CUES	ERRORS
Determine if glass needs replaced Determine if chanels are reusable Determine if reulator needs replaced	Broken glass Window will not operate	Broken glass

(TASK STATEMENT) Inspect and Service Windows

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: length Non-geometric measurement: Lube Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading		Terminology/general vocabulary, logic Comprehension, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Service Hood

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Hinges Latches Cables Springs Shims Lube	Check hood operation Remove and replace hinges Remove and replace latch Remove and replace latch cable Lube Adjust hood	Wear eye protection Use care handling springs in hinges

DECISIONS	CUES	ERRORS
Determine if latch is good Determine if hinges need eplaced Determine if hood is adjusted correctly	Hood will not open Hood will not close Loose fit	Broken and cracked hoods

(TASK STATEMENT) Inspect and Service Hood

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: length Non-geometric measurement: Lube Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, logic
Reading		Comprehension, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Service Seat

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Cushions Cylinder Air hose Pivot assembly Control valve	Check seat operations Remove and replace cushions Remove and replace air cylinder Repair hoses Remove and replace pivot assembly Remove and replace control valve	Wear eye protection Drain air tank

DECISIONS	CUES	ERRORS
Determine if seat is operating correctly	Seat too high Seat too low Seat too hard	Bad seat causes driver fatigue

(TASK STATEMENT) Inspect and Service Seat

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: length Non-geometric measurement: Lube Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading		Terminology/general vocabulary, logic Comprehension, progress reports, terminology.
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Service Ventilators

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Hinges Levers Control cable Springs Lube	Check vent operations Remove and replace vent doors Remove and replace control cable Adjust vent doors Lube	Wear eye protection

DECISIONS	CUES	ERRORS
Determine if vents are opening and closing fully	Will not operate Leaking air	Uncomfortable drive.

(TASK STATEMENT) Inspect and Service Ventilators

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills Instruments: ruler Geometric measurement: Length Non-geometric measurement: Lube Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading		Terminology/general vocaublary, logic Comprehension, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

(TASK STATEMENT) Inspect and Service Mirror

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Arms Glass	Remove and replace mirror arms Remove and replace mirror glass Remove and replace mirror Adjust mirrors	Wear eye protection Use care in handling glass
DECISIONS Determine if driver's view is sufficient	**CUES** Broken glass Loose mirrors	**ERRORS** Poor visibility

(TASK STATEMENT) Inspect and Service Mirrors

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Behavioral Science See appendix	Set of real numbers: Rationals Fundamental Operations (Calculation) Basic measurement skills and concepts Instruments: ruler Geometric measurement: Length Non-geometric measurement: Lube Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking Reading Writing Listening Viewing		Terminology/general vocabulary, logic Comprehension, progress reports, terminology Penmanship, spelling, reports, terminology/general vocabulary, logic Auditory discrimination, logic, noise discrimination Visual analysis, logic

(TASK STATEMENT) Check and Service Speedometer and Tachometer

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Basic tool kit Hand tachometer Cable Adaptors Lube Gears	Inspect speedometer cable Inspect tachometer cable Check speedometer head Check tachometer head Remove and replace cables Remove and replace heads Remove and replace drive gears Lube	Wear eye protection
DECISIONS Determine if reading is correct Determine if cables are usable	**CUES** Not operating Incorrect readings	**ERRORS** Vehicle speed incorrect Engine speed incorrect

(TASK STATEMENT) Check and Service Speedometer and Tachometer

SCIENCE	MATH – NUMBER SYSTEMS
Physical Science Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Magnetic fields of force Inertia and momentum Effects of friction on work processes and product quality Relationship of force to distortion in an elastic body Resistance of materials to change in shape Behavioral Science See appendix	Set of real numbers: Rationals Uses of numbers without calculation: Ratio Fundamental Operations (Calculation) Basic measurement skills and concepts Instrument: tachometer Non-geometric measurement: Lube, R.P.M. Reading and interpreting tables, charts, and graphs: specification charts Basic deductive logic

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking		Terminology/general vocabulary, logic
Reading		Comprehension, progress reports, terminology
Writing		Penmanship, spelling, reports, terminology/general vocabulary, logic
Listening		Auditory discrimination, logic, noise discrimination
Viewing		Visual analysis, logic

BEHAVIORAL SCIENCE

The individual will develop the basic skills and knowledge of the occupation along with the attitudes that will enable him/her to hold a job.

An individual will show professionalism in the following ways:

1. Appropriate personal appearance
2. Friendly cooperative attitude toward co-worker
3. Dependability in carrying out responsibilities
4. Demonstrate initiative in performing duties
5. Demonstrate cooperation in working for group goals
6. Demonstrate an ability to accept correction
7. Develop work habits of cleanliness and neatness

Appendix

Basic Tool Kit

3/8" Drive Socket Set with Drivers

1/4" Drive Socket Set with Drivers

4 Pair Assorted Pliers

Screwdrivers 5 - Straight Blade 4 - Phillips

Hammer

File

Carbon Scraper

Screw Starter

Pick-up Tool

Knife

Punches-5

Chisels-4

Ignition Wrench Set

Test Light

Thickness Gauges

Ruler

Wire Brush

Hack Saw

Allen Wrench Set

Flare Nut Wrenches

Pry Bar

Box End Wrenches 3/8" - 1 1/4"

Open End Wrenches 3/8" - 1 1/4"